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Technical News Bulletin No. 68

December 11, 1922.

GENERAL NOTE

Owing to the current nature of the investigations mentioned in the Technical News Bulletin, sometimes it will be impossible to supply printed information regarding them. However, in these cases, when the investigation has progressed sufficiently far, the Bureau will be pleased to furnish technical data to those engaged in the particular application of the subject, in order to avoid the delay incident to publication.

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1 Intensity and Duration of Fire

Some experimental work has been undertaken by the Bureau of Standards in connection with investigations of the fire-resistive properties of building materials, to determine the actual fire exposures to which building constructions may be subjected as used to house various occupancies. In furnace fire tests of such constructions, they are subjected to fire exposure the intensity of which is determined according to a standard time-temperature relation, the furnace temperature being near 927°C (1700°F) at the end of the first hour, 1010°C (1850°F) at 2 hours, and following this a uniform rise to a maximum of 1260°C (2300°F) at 8 hours if the test is continued to this point. This intensity has been thought to represent a moderately severe building fire, the duration of which will depend on the building construction and building contents, the latter being determined in a general way by the occupancy. Fires of long duration and high intensity are produced by such occupancies as heavy manufacturing, merchandizing, and storage, with office and residence occupancies at the other end of the scale, as giving the least duration and intensity.

In a test just completed at the Bureau, a one-story brick and concrete building, 16 x 30 feet, was fitted up with discard furniture to represent a fairly severe office occupancy. A wooden top floor on sleepers in cinder fill was placed on the concrete base floor. The

window openings were provided with pivoted incombustible shutters for regulation of air supply to give maximum fire conditions. At first an attempt was made to simulate an exposure fire. In such a case the fire enters in considerable volume from the adjoining rooms or buildings and to approximate this condition an amount of readily combustible material was ignited at one point near the end of the room. It was hoped that approximately simultaneous ignition would be secured in all parts of the building, but the attempt failed because of the blanketing effects of the gases which had to be retained in order to raise the temperature to the ignition point. The fire started at one end of the building and progressed to the other in about 15 minutes. Measurements made at about 40 points gave temperatures in excess of 400°C (952°F) for a little over one hour, the maximum recorded being 1089°C (1992°F). The average maximums for all levels for three sections of the building taken in the direction of travel of the fire were about 850°C (1562°F), 940°C (1724°F), and 950°C (1742°F), respectively. This corresponds to an average exposure a little more severe than the first hour of a standard test fire. Some difference in temperature obtained between the upper and lower levels, although this was not large. Everything of combustible nature, including the contents of metal filing cases, was destroyed except portions of the sleepers in the cinder floor fill. The contents of an insulated steel safe of a type recommended for use in office buildings of fire-resistive construction were fully preserved, the temperatures within the safe corresponding to those obtaining after a one-hour exposure in a test furnace.

It is apparent that to be conclusive further experiments will be necessary, particularly to determine the effects of larger room dimensions on intensity and duration. Efforts are also being made to obtain an estimate of intensities of fires in buildings by examination of fire ruins. An inspection made of the Burlington Building (Chicago, Ill.) after the fire of March 15, 1922, indicated that maximum temperatures between 950 and 1050°C (1742 to 1922°F) obtained generally over the burnt portion to judge by fused metals, the melting points of which were later ascertained, and at a few locations the temperatures exceeded these averages by about 100°C.

2 Hollow Tile Investigation

An investigation of the fire-resistance and related physical properties of hollow building tile has been conducted by the Bureau of Standards during the past two years in cooperation with the Hollow Building Tile Association. A furnace, suitable for making fire tests of small panels up to 4 feet square, was built and tests of

unprotected panels built from tile of representative clays have been made in order to establish characteristic behavior under fire. A wide range in fire resistance was found, depending mainly on the mineral composition of the clays employed. As a possible means of increasing fire resisting properties, grog additions up to 10% were tried, but it was found that the small addition which can be conveniently made in manufacturing practice had no effect, and that additions of 5% or more decreased the fire resistance. The protection afforded by typical plasters has been determined, obtaining, generally, excellend results. The effect of the addition of combustible filler to the raw material, of the fineness of grinding of the raw material, of the size of the unit and of changes in design of the tile, will be ascertained.

In conjunction with the fire tests, determinations of the absorption, compressive strength, expansion, mineralogical composition, and ability to withstand freezing are being made. Several different methods for determining the absorption were tried, and as a result saturation of the specimens by boiling 5 hours and allowing to soak in water at room temperature for at least 1 hour before taking the saturated weight, was adopted as giving the most practical and consistent results for inspection work. This part of the investigation has been reported in a paper on "Effectiveness of Different Methods of Making Absorption Determinations" in Vol. 5, No. 11 of the Journal of the American Ceramic Society. The method of preparing tile for compressive strength tests was studied in a series of tests in which tiles with various caps at ages from 1 hour to 7 days were used. The results indicated that a cap of 3 parts of Portland cement to 1 part of unretarded gypsum (plaster of Paris) at the age of 7 days gives the highest and most consistent strengths.

3 A Study of Clay Suspensions

The rate of settling of clay is thought to be an important matter in connection with the use of clays as a filler in paper-making.

The rate of settling of clay in a medium is to a certain extent dependent on the hydrogen-ion concentration of the suspending medium. The rate of settling of 6 clays has been studied over a wide range of hydrogen-ion concentrations. For each clay water mixture, there is a definite hydrogen-ion concentration at which the rate of settling will be a maximum, and also a definite concentration at which this rate is a minimum. In the purification of clay, these 2 points should be known in order to effect the separation of clay particles from quartz and mica particles most efficiently.

4 Problems Relating to Saggars

Saggars are containers employed in manufactories of chinaware for holding plates, cups, saucers, etc., during the firing in the kiln. These containers are made of clay which must have considerable strength and be of good refractory quality. The Bureau is conducting a thorough investigation involving a geographical study of saggar clays to classify them according to their properties, and finally to see what may be done toward increasing the life of the saggar.

To obtain a list of the saggar clays used throughout the country, letters were sent to 100 different manufacturers using these clays. In these letters request was made for the names of the clays employed, dealers from whom clays could be obtained, and the district where they were mined. This information was cheerfully given by a very large proportion of the concerns addressed. So far as can be judged from the information obtained, about 90 different clays, or rather clays sold under approximately 90 different names are being used for saggars in the United States. A letter has been written to producers of and dealers in saggar clays to obtain information necessary to make the list more accurate and more easily understood.

Samples of 52 different clays, representing as well as could be judged all the important types, have been sent for and many of them have already reached the laboratory. These are being obtained in 200 lb. lots from the users rather than from producers or dealers in order to eliminate uncertainties as to whether samples are representative of the commercial output of the mines or pits. Manufacturers are contributing these rather large samples from their stocks and prepaying the freight to Washington. This illustrates the wholehearted manner in which industries are responding to the Bureau's calls for assistance in its investigations.

In order to classify the saggar clays according to their properties, they are being subjected to the following tests: Water of plasticity, shrinkage, porosity, transverse strength, and burning behavior at 5 different cones. Some work has been done upon all the clays received and in getting this work under way considerable attention has been given to details of test methods. It is considered necessary, in order that the results of these tests may be of value, to devise, where necessary, methods or modification of methods which will insure greater accuracy than is usually attained in such measurements. This involves the elimination of sources of variation all along the line in order to obtain close checks in the final results. As this is a feature which justifies closer

attention than it has received up to this time from ceramic industries, it is proposed to include in the report of this investigation not only averages but maximum departures from these mean values.

5 The Scumming or Weathering of Glass

The conditions under which glass is stored have a pronounced effect upon the appearance of the glass. For some time the Bureau has been studying this problem, and during the past month several hundred bottles which have been in storage 6 months under different conditions of storage and packing, were examined.

The results show quite definitely the better condition of ware stored in a dry place with an even temperature as compared with outdoor conditions or a very humid room, the latter being much more productive of scummed bottles. Bottles packed in thin fibre board boxes were in better condition than those packed in open crates, while bottles wrapped tightly in paper were in worse condition than those not wrapped. Cork or paper stoppers did not assist greatly in reducing the amount of weathering, but rubber stoppers nearly eliminated it. Dust seemed to accelerate the trouble. Samples stored in factory warehouses and at Panama are still to be investigated.

6 Optical Specifications for Glass for Balloon Hangars

The first specifications to be prepared by the Government covering window glass for use in balloon hangars were written apparently without reference to the difficulties that might be encountered in carrying out the necessary tests, as they were so worded as to require testing the effectiveness of the glass in excluding ultra-violet and infra-red rays by using sunlight as the source of radiation for the necessary measurements. This procedure is inconvenient in view of the fact that the tests cannot be made at any time and in any place.

The original specifications required a glass that excluded 85% of the ultra-violet rays and 55% of the infra-red rays of the sun. Since the Bureau of Standards was not responsible for writing the specifications, all that could be done was to test the glasses submitted in accordance with the practice laid down, that is, by using sunlight as the source of radiation. For this purpose a new spectropyrheliometer was devised, described in Bureau of Standards Scientific Paper No. 378, by means of which instrument the ultra-violet spectrum was separated from the visible spectrum and the absorptive properties of the glasses for the ultra-violet solar rays was determined.

In order to put this work upon a convenient testing basis which could be carried out in the laboratory, the transmission of these glasses was determined also for various wave lengths using the ultra-violet emission

spectrum of the quartz mercury vapor lamp. From these tests it was established that if a colored glass or clear glass covered with asphaltum paint is to exclude 80 to 85% of the ultra-violet rays of the sun, its ultra-violet spectral transmission (Tr including reflection) shall not exceed the following values: at 0.405μ Tr = 30 to 40%, 0.365μ Tr = 12 to 15%, and at 0.313μ Tr = 0.5 to 1%.

The measurement of the transmission of infra-red radiation from the sun is usually made by covering a copper-constantan thermocouple with a red glass, such as Jena 4512, and exposing this combination radiometer directly to the sun's rays. As a laboratory source of infra-red radiation, a gas-filled tungsten lamp under normal operation was used. The infra-red transmission of solar radiation was not markedly different from that of the gas-filled tungsten lamp. For the glasses thus far tested, the transmission, including reflection losses, varied from 25 to 35% which is well below the value set in the original specification.

Since the exclusion of the ultra-violet rays appears to be more important than that of the infra-red rays, it seems desirable to insist upon the exact adherence to the specification for the elimination of the ultra violet solar rays. It may be added that the glasses tested were of the wired type with one side rough or corrugated. The corrugations or roughness were removed and the surface polished. Measurements were made on areas clear of wire, bubbles, and opaque spots. The average transmission of the clear areas but with the corrugations in place would be somewhat lower and the exclusion of the ultra-violet would be higher than cited above. However, these values establish a criterion for judging the optical qualities of the glass.

7 Preliminary Data on the Color-Temperature Relations of Daylight at Washington

Some interesting work is in progress on the color-temperature relations of daylight as measured by observers of the Bureau of Standards at Washington. Values of color-temperature have been obtained varying from about 5000°K for direct sunlight to about 25000°K for clear northwest sky. Values for overcast skies or for the whole sky unclouded, including the sun, vary from about 6000° to 7300°K, with higher values for the early morning light.

8 Electrical Device for Detecting and Indicating the Amount of Water in a Nearly Dry Gas

An electrical device for detecting and approximately indicating the amount of water in a nearly dry gas, upon which a considerable amount of work was done several years ago, has been again tried out with surprisingly good results. The detector appears to have lost none of its sensitivity during nearly 3 years in the laboratory. This would indicate that it may be relied upon as an

alarm device in the liquefaction and nitrogen fixation industries where such a device is greatly needed. The Bureau hopes to prepare and publish a description of the device in the near future.

9 Stainless Steel for Analytical Weights

In connection with information desired by the division of weights and measures, the chemistry division of the Bureau has completed the analysis of a set of stainless steel analytical weights. It was found that the material used was of the usual composition for this type of alloy. It is interesting to note, however, that after a few days' exposure of one of the two gram weights to the fumes of the laboratory, considerable rusting was developed. It, therefore, appears questionable whether stainless steel can be used for analytical weights where corrosive conditions are severe.

10 Metallographic Etching Reagents for Carbides, etc., in Alloy Steels

Some tests have been made to verify the results obtained previously as to the etching effect of a dilute sodium hydroxide solution aided by weak electric current. It was found that electrolytic etching with weak solutions of ammonia and with sodium hydroxide has a very similar effect upon the various constituents found so far in alloy steels, namely, both solutions darken chromium carbide and tungsten carbide, while iron carbide and iron tungstide remain unaffected even after etching for several minutes.

In the examination made in connection with the above-mentioned tests of two samples of high speed steels melted and cooled in vacuo, an unidentified constituent of relatively great hardness was found present. It did not respond to the test for iron carbide and iron tungstide and did not assume any shape usually met with in the case of tungsten carbide. It did respond, however, to the test for chromium carbide, that is, it was darkened by either sodium hydroxide or ammonia. It appeared to be similar in behavior on etching to the very minute particles noted in the matrix of high speed steel in the condition as received from the mill which were brought out by either ammonia or sodium hydroxide.

Since it would appear from the results of previous investigators that a large part of the chromium present in the high speed steel is dissolved in the matrix (this would depend on the heat treatment received) while a large part of the vanadium is present in the free state as carbide, it seemed possible that the constituent referred to above might be a carbide of vanadium. To test this out an iron-carbon-vanadium alloy is now being prepared wherein it is hoped to have the vanadium and carbon present entirely as vanadium carbide, and etching

tests will be carried out with the hope of finding a means of distinguishing between vanadium carbide and chromium carbide.

11 Gases in Metals

The work originally outlined on the investigation of methods for determining the oxygen and hydrogen evolved from metals fused in vacuum is now completed, and the first draft of a complete report of the investigation has been prepared. It will, however, be some time before it is ready for distribution.

It was found that the most satisfactory method of heating the metal samples for the extraction of gases under vacuum is by the use of a high-frequency induction furnace. This method of heating has eliminated many of the difficulties and sources of errors common to previous methods of vacuum fusion. The analyses of the evolved gases for oxygen and hydrogen are carried out gravimetrically by the use of a train of solid absorbents which satisfactorily absorbs the gases even at comparatively low pressures as rapidly as they are pumped out of the furnace. A modified form of absorption tube has been developed which is connected in the all-glass train by means of ground glass joints so that it can readily be removed for weighing.

Three methods of fusing the metal samples have been investigated, namely, direct fusion in a refractory oxide crucible; fusion with antimony-tin alloy in an oxide or silicate crucible; and fusion in a gas-free graphite crucible. The antimony-tin method was originally developed by Goerens and is usually so named, while fusion in graphite is a method previously attempted by Walker and Patrick. Each of these three methods of fusion has been tried using both carbon-free and carbon-bearing metal. The usual refractories were found to be entirely unsuitable for use in the direct fusion of carbon-bearing metals without any alloying addition.

12 Standard Sample Metals with Certified Gas Content

Frequent requests are now being received by the Bureau for standard samples of iron having certified gas or oxygen content. These requests have come from technical schools and university laboratories and experiment stations, from metallurgical plants, and from commercial research institutions. Practically every request states that the material is required for use in checking and standardization of analytical methods employed in investigation the effects of gas content upon the quality of some iron or steel product. Such requests are usually accompanied by questions for advice as to suitable methods of chemical analysis.

Completion of the Bureau's work on methods of determination of hydrogen and oxygen in metals will serve greatly to stimulate and assist such researches besides calling attention to the Bureau's facilities in this field of metallurgy.

13 The Casting of Platinum Metals

Satisfactory methods for casting in chilled molds small melts of platinum and platinum alloys have been developed. A lot of platinum, 10% rhodium alloy, of excellent quality has been prepared and drawn to wire. This material under the thermoelectric test showed practically no difference between the opposite ends of a 20-ft. length of wire. The e.m.f. against the standard pure platinum of the Bureau was the same as the standard accepted value for a 10% rhodium alloy. This material is to be used by the heat division of the Bureau as the alloy element in its standard thermocouples, the pure platinum wire for these couples having been prepared some time ago.

14 Gage Steel Committee

Representatives of the Bureau of Standards attended the meeting of the Gage Steel Committee in New York, November 17. Progress reports on the work so far done by the committee were considered and a program outlined for continuing the work.

The samples of steel selected by the committee for investigation have been received and preliminary work is well under way. Dimensional changes on hardening, and changes with time after hardening are being studied; also the rate of wear of different specimens which have been subjected to various heat treatments.

15 National Screw Thread Commission

The National Screw Thread Commission on which the Bureau of Standards is represented met in New York on November 16 and gave further consideration to the standardization of Fire Hose Threads, tap drill and wire gage sizes, bolt heat and nut sizes, and oil well casing threads.

Revised specifications for Fire Hose threads were approved by the Commission, and plans were made for conducting a public hearing on casing threads, the meeting to be held in St. Louis, December 6. A joint meeting with the Standardization Committee of the American Petroleum Institute to be held in St. Louis December 7, was also arranged for further consideration of casing threads.

It was proposed to change the system of numbering the fits established by the Commission from that employed in the Progress Report involving II A, II B, IV A and IV B, to a consecutive series of numbers. Action was deferred until the next meeting.

16 Electric Telemeter — During the past two years or more, the Bureau has been engaged in developing electric telemetric devices based upon the fact that carbon contact resistances vary with pressures or displacements applied to their terminals. Many attempts have been made in the past to utilize this principle for various engineering and scientific measurements, particularly in those cases in which it was desirable to place the indicating or recording instrument at a considerable distance from the actual member or element under test, but until recently no success has been met with. The trouble in the past has been due to several inherent difficulties with apparatus of this kind. In the first place, as heretofore used, these carbon contact resistances have been very erratic in their performance and the constancy of their calibration could not be depended upon sufficiently to warrant their application to ordinary engineering uses. A second difficulty has been due to the fact that, as heretofore used, such apparatus has shown large hysteresis effects, that is, the indications of the apparatus have been very different on rising pressures or displacements than for the same values approached from a higher limit. Errors due to this cause usually reached from 20 to 50 per cent or even more.

A third difficulty grows out of the fact that these devices are inherently non-linear in their characteristics, that is, the readings of the indicating instruments are not proportional to the pressures or displacements that are being measured,- a characteristic which is very objectionable in most engineering work. The Bureau has investigated all of these sources of trouble and has found means of eliminating all of them to a degree which makes the apparatus well adapted to a great variety of engineering measurements. These include measurements of strains in bridge members and other engineering structures, measurements of accelerations, vibrations, and pressures of practically every description. The apparatus can be made either indicating or recording as desired. Up to the present time both indicating and recording instruments embodying this principle have been made for and largely used by the Bureau of Aeronautics of the Navy Department for measuring stresses both in airplane members and dirigibles where it is very important to read such stresses at a point more or less remote from the member under test. Similar apparatus has also been used extensively by the Bureau of Standards in laboratory tests on large structural members and also in connection with certain dynamometer work, and for much of this work the new instruments have been found to be substantially equal in accuracy to anything heretofore available in the line of indicating instruments, and they possess the

additional advantage of permitting remote reading as well as graphic records to be made when desirable. Work is now in progress looking to the extension of the field of application of these instruments to the various lines of engineering work to which they are peculiarly adapted.

17 Dry Cell Specifications

The Bureau of Standards has issued specifications for the standard sizes of dry cells and flashlight batteries. These specifications are a revision of similar specifications prepared several years ago, and published in the first edition of Circular No. 79, on the electrical characteristics and testing of dry cells. In revising these specifications the Bureau has received the hearty cooperation of the leading manufacturers and some of the largest individual users of dry cells. Special mention is made of the cooperation received from the American Telephone and Telegraph Company and the Signal Section of the American Railway Association.

Before beginning the revision of the specifications a conference was called which met at the Bureau of Standards, to which the manufacturers, various government departments, and a few of the largest individual users were invited to send representatives.

A limited number of copies of the new specifications is available for distribution prior to publication of the second edition of the dry cell circular now in press.

18 Rate of Sulphation of Storage Battery Plates

An investigation has been undertaken by the Bureau of Standards to establish, if possible, a speedy and accurate method for the measurement of the effect of impurities in storage battery electrolytes. Methods which have previously been used require considerable time, and accurate and consistent results are difficult to obtain with them. The new method which has been devised is based upon successive weighings of the positive or negative plates while immersed in the solutions to be tested, which are maintained at a constant temperature. The battery plates were immersed in the various electrolytes contained within a thermostat bath and so arranged that any plate could be brought in the arm of a sensitive balance for weighing. Weighings of the plates were made daily, and the results were computed as the increase in weight of the plate per hour. The results showed considerable differences in the rates of sulphation of plates made by various manufacturers, and marked differences in the rate of sulphation produced by different concentrations of the acid solution were demonstrated. Temperature also plays an important part in determining the rate of sulphation.

19 Magnetic Susceptibility and Iron Content of Cast Red Brass

This investigation was mentioned in Bulletin No. 62, June 8, 1922, and complete results are now available in Technologic Paper No. 221. Copies can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5¢ per copy. It was found that the physical condition of the material as affected by heat treatment exerted a great influence on its magnetic properties and that a quantitative determination of the iron, at least in this type of material, is not feasible. No direct relationship was found between the magnetic properties and the iron content.

20 Work in Progress on Fundamental Electrical Units and Standards

The electrical units which are in use in the measurement of power and in various scientific and technical investigations are what are known as the international electrical units. These units were intended to be the same as the corresponding units based on the centimeter, gram, second system of units. However, the fundamental measurements on which the specifications for these units are based were made more than 30 years ago.

In the meantime there has been a marked improvement in electrical measurements generally, and a few fundamental measurements made more recently show that the magnitudes of some of the international electrical units differ from the magnitudes they were intended to have by fully one part in two thousand. Consequently, if we are to have and use electrical units which are to be considered definitely a part of the general system of units so that, for example, a watt measured electrically and a watt measured mechanically shall be the same, we must make suitable measurements in such a way as to determine the magnitudes of electrical quantities in terms of the units of the fundamental magnitudes, namely, length, mass, and time.

The Bureau of Standards is, therefore, taking up again work on fundamental electrical units which was begun soon after the Bureau was established, but which had to be discontinued some years ago. The work now in progress is on the measurement of inductance and resistance. Presumably work on the measurement of current will be taken up after work on these two has reached a satisfactory stage.

To make the results of this investigation more reliable and to reach a fair estimate as to their reliability, it is planned to carry out the measurements in different laboratories using independent observers and as far as possible independent methods of measurement. The work now in progress on inductance and resistance will require several years for its completion, and very probably the work on the measurement of current will require an equal time.

21 Bibliography and Patents on Electrical Insulating Material

In connection with the Bureau's investigation of the properties of certain types of electrical insulating materials, a rather comprehensive bibliography of papers, books, and periodicals has been prepared.

An examination of the U. S. patents covering insulating materials and methods of manufacture, and particularly materials of the phenolic type, has also been made, and a list of the more important U. S. patents issued prior to September, 1920, was completed. It is hoped that sometime later this list will be brought up to date.

In Technical News Bulletin No. 67, item 6, mention was made to Technologic Paper No. 216 on the "Properties of Electrical Insulating Materials of the Laminated Phenol-Methylene Type" which can now be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 30¢ per copy. Space did not permit the publication in this paper of the complete bibliography of insulating materials or the patents list.

Since a considerable demand has arisen for copies of these, they have been issued in mimeographed form as Letter Circulars Nos. 50 and 51 "Bibliography of books and titles of periodicals on properties and uses of insulating materials" and "Lists of the more important U. S. patents covering the materials and methods of manufacture of an insulating material." Only a limited supply of these two letter circulars is available, but a copy will be sent on request, as long as the supply lasts, to any person who can show an actual need for them.

22 Conference on Radio Standardization

The Bureau of Standards of the Department of Commerce has called a conference on radio standardization to be held on Friday, January 12, 1923, in New York City. This conference, the desirability of which has long been apparent, has been called at the specific request of the following associations and organizations: Institute of Radio Engineers; National Radio Chamber of Commerce; Radio Apparatus Section, Associated Manufacturers of Electrical Supplies; National Retail and Dry Goods Association; American Radio Relay League; and the Radio Corporation of America.

These organizations have pointed out that there is need for greater uniformity in the methods of describing, rating, and testing of performance of radio apparatus.

Invitations are being issued to all of the national associations of an engineering and technical nature which are known to be interested in radio standardization. The representation of radio manufacturers will in general be through the trade associations of which they are members. While it is desired to make the conference thoroughly

and broadly representative, it is expected that the organizations invited will limit their representation to one or two persons in order that the conference may be as effective as possible.

The purpose of the conference is to consider broadly (1) whether a formulation of standards for radio apparatus and service shall be made, (2) if so what general classes of apparatus or service should be included, and (3) what procedure shall be recommended for carrying out the conclusions reached by the conference. If the conference decides that radio standards should be formulated, it is expected that they will be prepared with special consideration of the wide range of interests which are concerned with the subject, and that these standards may ultimately be adopted with the approval of the American Engineering Standards Committee as an American standard.

23 Utilization of Gas

In connection with the convention of the American Gas Association held at Atlantic City during the week of October 23, the Bureau of Standards had an exhibit which attracted a great deal of attention. In this exhibit the principal gas publications of the Bureau were shown as well as other publications that might be of interest to gas engineers. A demonstration illustrating the results of improvements in burner design appeared to excite special interest. In this connection an ordinary burner and beside it one of improved design were shown. The burner testing apparatus of the Bureau was also on exhibit and frequent demonstrations were made showing the operation of burners under various conditions. The value of this apparatus which has been developed at the Bureau of Standards was so apparent that the utilization department of one of the largest gas companies recently had two of their engineers visit the laboratories to investigate in more detail the operation of the apparatus with a view to installing similar equipment in the laboratory of the gas company.

It is believed that the exhibit served to greatly increase interest in the Bureau's work on the better utilization of gas, and a number of appliance manufacturers have expressed their desire to assist the Bureau in every way possible. Over 60 manufacturers and engineers have been supplied with publications dealing with gas appliances.

24 Traffic Signals

The Bureau of Standards, in conjunction with the National Safety Council and the American Association of State Highway officials, has undertaken a project for the stardardization of colors of traffic signals. This will cover both luminous and non-luminous highway signals and related subjects.

A committee has been organized to handle this work and held its first meeting in New York City on November 9. An executive committee was elected to adminster the details of the project, and the following officers were elected: Chairman, C. J. Bennett, Commissioner of Motor Vehicles of Connecticut; Vice-Chairman, M. G. Lloyd, Chief of the safety section of the Bureau of Standards; Secretary, W. S. Paine, Hartford, Conn., representing the National Safety Council. Three subcommittees were appointed which will collect information and data as to past practices and will carry out any investigations which may be necessary to determine the selection of proper colors and other items for traffic signals.

25 Safety Campaign in Washington, D.C.

In connection with Washington's safety campaign and arrangements for Safety Week, from November 29 to December 2, several members of the Bureau of Standards took an active part. The chief of the safety section represented the Department of Commerce upon a general departmental committee which made preparations for the safety campaign. Another member of the staff acted as chairman of a committee on radio which arranged for the broadcasting of speeches dealing with safety. Arrangements were also made for the sending of safety messages from such distant sending stations as Pittsburgh, Pa., and Schenectady, N. Y. Another member of the staff served on the committee of speakers, the head of the shipping section of the Bureau on the committee on motor organization, while still another represented the department on the women's committee.

26 Power Losses in Automobile Tires

Power loss tests have been completed on a total of almost 100 tires of different sizes and makes. The data obtained are being compiled and put in shape for publication, but it will, of course, be some time before this will be ready for distribution.

The endurance testing machine continues to run 24 hours a day so as to obtain data as rapidly as possible on the mileage to be expected from different makes of tires.

27 Simplification of Sizes of Paper

The report of the committee, appointed by the Department of Commerce through the Bureau of Standards, to study the possible simplification of sizes of paper, which was submitted to the Bureau September 22, 1922, was published in the Paper Trade Journal of November 9. The recommendations of this committee are being referred to manufacturers, merchants, and others interested in the subject, and the Bureau will make definite recommendations after having received these criticisms. All those interested in the subject are earnestly requested to communicate with the Bureau in regard to it.

28 Numbering System for Lubricating Oils

An open meeting of the Interdepartmental Committee on Petroleum Products was held November 13, at which the subject of a numbering system for oils was discussed. There was general agreement that there should be a numbering system based on the viscosity, but a difference of opinion as to the temperature at which viscosity should be determined developed. The Interdepartmental Committee advocates a change to 130°F for all oils except heavy oils whose viscosity is now determined at 210°F, while the Society of Automotive Engineers and the American Petroleum Institute agree with each other that the temperature of 100°F should be retained for oils of low viscosity.

29 Standardization of Saybolt Universal Viscosimeter

A conference was held at the Bureau November 14 with members of the American Petroleum Institute, as a result of which a committee of 5 members of the Institute was appointed to cooperate with the Bureau in expediting the more accurate standardization of the Saybolt Universal viscosimeter.

Respectfully,

S. W. STRATTON

Director
HGB